Specifications for Ordering Interference Coatings on Fiber Tips

Omega Optical offers a variety of coatings on fiber tips – including full/partial reflectors, long pass, short pass, band pass, and antireflection designs. It should be understood that the performance of interference coatings depends on the angle-of-incidence (AOI), and that fibers present a distribution of AOIs to the coated tip. Further, Omega's coated tips are hard enough to be connected to other fibers such that the filters are immersed in a glass-filter-glass configuration. The numerical aperture (NA) of the chosen fiber, and how the fiber is connected in an application, will influence filter performance. As a result, we request that customers populate the following check-list to help us meet the goals of a given application. All entries, including questions and incomplete entries, are welcome.

Filter Characteristics[1]

(circle one) LP SP BP Reflector (full or partial)
Cut-on _____ ± _____
Cut-off _____ ± _____
%T (peak) _____
Attenuation λ range _____
Attenuation OD _____
%R (peak) _____ ± _____
%R λ range _____

Fiber Characteristics[2]

Numerical aperture (NA) _____
Core diameter _____
Clad diameter _____
Fiber length _____
Fiber material (glass, plastic, chalcogenide)
Single mode or multimode at the operational wavelength (circle one)
Degree of mode filling (if known) _____
Maximum temperature of jacket _____
Other (PMF, micro-structures, etc)
_____

Fiber Tip Characteristics[3]

First end connector (FC, SC, LC, SMA, None)
Second end connector (FC, SC, LC, SMA, None)
If no connector (cleaved, lensed, polished bare ferrule)
Which end(s) are to be coated _____

Fiber Configuration[4]

___ Coated tip operating in air
___ Coated tip connected to an un-coated tip
Number of expected connections and disconnections _____
Number of fibers to be coated _____
Fiber supplier _____
_____

Notes

1 – Steep spectral edges and rigorous blocking specifications lead to designs with high physical thickness. We have found that fiber tips can support up to about 6 microns of material. Thick coatings can delaminate and/or allow core to clad leakage. Omega will advise customers regarding the thickness of a proposed filter.

2 – Multimode fiber with high NA leads to high AOI. High AOI causes any interference filter to blue-shift. The observed spectral performance will be a weighted average of the performance at each angle. These spectral shifts can be both modeled and measured at Omega.

3 - Omega monitors the reflectance of fiber tips during deposition. This requires that the uncoated end of the fiber being monitored must be terminated with a connector (preferably FC/PC). If a connectorized end is not appropriate for a given application, Omega will place an extra fiber near the customer's fiber for monitoring purposes.

4 – Near zero blue shifts occur if a single mode tip is coated and connected to another single mode tip. The number of fibers allowed in one deposition depends on the fiber configuration (connectorized, cleaved, bundled, etc).